

Appln. No. 09/898,467
Supp. Amd. dated December 16, 2003

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

2. (Currently amended) The measurement station according to Claim ~~19~~, wherein said measuring unit is operable to measure a thickness of at least a top layer of the wafer.

3. (Currently amended) The measurement station according to Claim ~~19~~, wherein said measuring unit is operable to carry out optical inspection of the processed wafer.

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Currently amended) A-The measurement station according to Claim 6 for use with a processing machine that includes a processing station for processing a semiconductor wafer and an exit station outside the processing station and including a wafer transfer means and at least one wafer cassette, the measurement station being so dimensioned as to be installable within the exit station of the processing machine and comprising

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a spectrophotometric measuring unit and a holding unit for receiving and holding the wafer in a measuring position during measurements, said measuring unit comprising an optical system including an imaging system operable to locate measurements, wherein the optical system comprises a focusing optics for focusing illuminating light onto the wafer and collecting light reflected from the illuminated wafer; a beam splitter for directing the illuminating light towards the wafer and directing the collected reflected light towards the spectrophotometer; and a pin hole mirror accommodated in an optical path of the collected light propagating towards the spectrophotometer and separating a portion of the collected light to propagate to a charge coupled device (CCD) for imaging.

4. (Currently amended) The measurement station according to Claim 3, comprising a support assembly for supporting the wafer that is to be received by the holding unit.

5. (Currently amended) The measurement station according to Claim 4, wherein the measuring and holding units are separated by a window through which at least a part of the wafer being held is viewable to enable optical measurements.

6. (Currently amended) The measurement station according to Claim 4, wherein said holding unit comprises an assembly movable along an axis perpendicular to the wafer's surface,

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thereby enabling said holding of the wafer in the measuring position.

13. (Cancelled)

14. (Currently amended) The measurement station according to Claim ~~19~~, having a footprint in at least one dimension of about a size of the wafer's diameter.

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Currently amended) The processing machine according to Claim ~~169~~, wherein said processing tool is a polisher.

19. (Currently amended) The processing machine according to Claim ~~169~~, and also comprising a robot for supplying the processed wafer to the measurement station.

20. (Cancelled)

21. (Currently amended) The processing machine according to Claim ~~162~~, wherein said measuring unit is operable to measure a thickness of at least a top layer of the wafer.

22. (Cancelled).

23. (Cancelled)

24. (Currently amended) The processing machine according to claim 22 for processing a semiconductor wafer, the processing machine comprising a processing station having a processing tool to be applied to the wafer, and an optical measurement station,

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the optical measurement station being associated with an exit station of the processing machine that includes a wafer transfer means and at least one wafer cassette, the optical measurement station comprising: a holding unit for receiving the wafer and holding it in a measuring position during measurements; and an optical system including a spectrophotometric measuring unit, an imaging system including a light detector operable to locate measurements, wherein the optical system comprises a focusing optics for focusing illuminating light onto the wafer and collecting light reflected from the illuminated wafer; a beam splitter for directing the illuminating light towards the wafer and directing the collected reflected light towards the spectrophotometer; and a pin hole mirror accommodated in an optical path of the collected light and separating a portion of the collected light to a—the light detector.

23. (Currently amended) The processing machine according to Claim 22, wherein said imaging system comprises a charge coupled device (CCD).

24. (Currently amended) The processing machine according to Claim 21, and also comprising a support assembly for supporting the wafer that is to be received by the holding unit.

25. (Currently amended) The processing machine according to Claim 21, wherein the measuring and holding unit are separated

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by a window through which at least a part of the wafer being held is viewable to enable optical measurements.

26 28. (Currently amended) The processing machine according to Claim 21, wherein said holding unit comprises an assembly movable along an axis perpendicular to the wafer's surface, thereby enabling said holding of the wafer in the measuring position.

29. (Cancelled)

27 30. (Currently amended) The processing machine according to Claim 21, wherein said measurement station has a footprint in at least one dimension of about a size of the wafer's surface.

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (New) The measurement station according to Claim 30, wherein the support assembly is configured to receive the wafer from the wafer transfer means of the exit station and enable the wafer transfer into the measuring position.

35. (New) The measurement station according to Claim 34, wherein the support assembly includes two support elements displaceable with respect to each other.

36. (New) The measurement station according to Claim 30, wherein the support assembly is configured for supporting the wafer at its periphery region.

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37. (New) The measurement station according to Claim 9, wherein the optical imaging system is operable to perform pattern recognition.

38. (New) The measurement station according to Claim 9, wherein the measuring unit comprises a fiber optics for directing light from a light source towards the focusing optics.

39. (New) The measurement station according to Claim 9, wherein the focusing optics comprises an objective lens arrangement.

40. (New) The measurement station according to Claim 9, wherein the imaging system includes a lens arrangement accommodated between the light detector and the pin hole mirror.

41. (New) The measurement station according to Claim 9, wherein the spectrophotometric measuring unit comprises a lens arrangement accommodated between the pin hole mirror and a spectrophotometer.

42. (New) The measurement station according to claim 9, wherein the optical system is configured for providing substantially normal incidence of the illuminating light.

43. (New) The measurement station according to Claim 9, wherein the pin hole mirror is accommodated so as to be an aperture stop in an optical path of the collected light, the pin hole mirror thereby appearing as a dark area in an image of a measurement spot on the wafer and allowing for locating the measurement spot.

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- 20 44. (New) The measurement station according to Claim 29, wherein the holding unit comprises a vacuum assembly for holding the wafer by vacuum.
- 21 45. (New) The processing machine according to Claim 26, wherein the support assembly is configured to receive the wafer from the wafer transfer means of the exit station and enable the wafer transfer into the measuring position.
- 22 46. (New) The processing machine according to Claim 25, wherein the support assembly includes two support elements displaceable with respect to each other.
- 23 47. (New) The processing machine according to Claim 26, wherein the support assembly is configured for supporting the wafer at its periphery region.
- 24 48. (New) The processing machine according to Claim 24, wherein the optical imaging system is operable to perform pattern recognition.
- 25 49. (New) The processing machine according to Claim 24, wherein the measuring unit comprises a fiber optics for directing light from a light source towards the focusing optics.
- 26 50. (New) The processing machine according to Claim 24, wherein the focusing optics comprises an objective lens arrangement.
- 27 51. (New) The processing machine according to Claim 24, wherein the imaging system includes a lens arrangement accommodated between the light detector and the pin hole mirror.

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3^{52.} (New) The processing machine according to Claim 24, wherein the spectrophotometric measuring unit comprises a lens arrangement accommodated between the pin hole mirror and a spectrophotometer.

3^{53.} (New) The processing machine according to Claim 24, wherein the optical system is configured for providing substantially normal incidence of the illuminating light.

3^{54.} (New) The processing machine according to Claim 24, wherein the pin hole mirror is accommodated so as to be an aperture stop in an optical path of the collected light, the pin hole mirror thereby appearing as a dark area in an image of a measurement spot on the wafer and allowing for locating the measurement spot.

3^{55.} (New) The processing machine according to Claim 24, wherein the holding unit comprises a vacuum assembly for holding the wafer by vacuum.